

4

Science Standard
4.3.d.



Microorganisms and the Human World

California Education and the Environment Initiative

Approved by the California State Board of Education, 2010

The Education and the Environment Curriculum is a cooperative endeavor of the following entities:

California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

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Key Partners:

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Office of Education and the Environment

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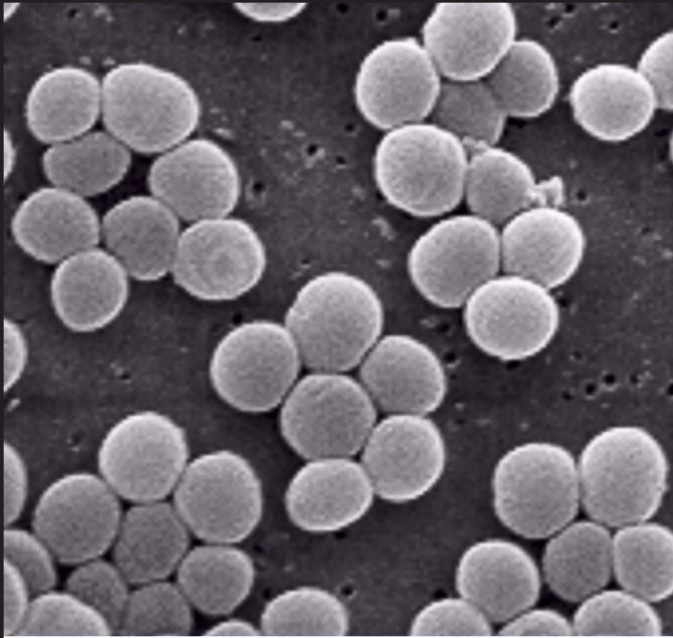
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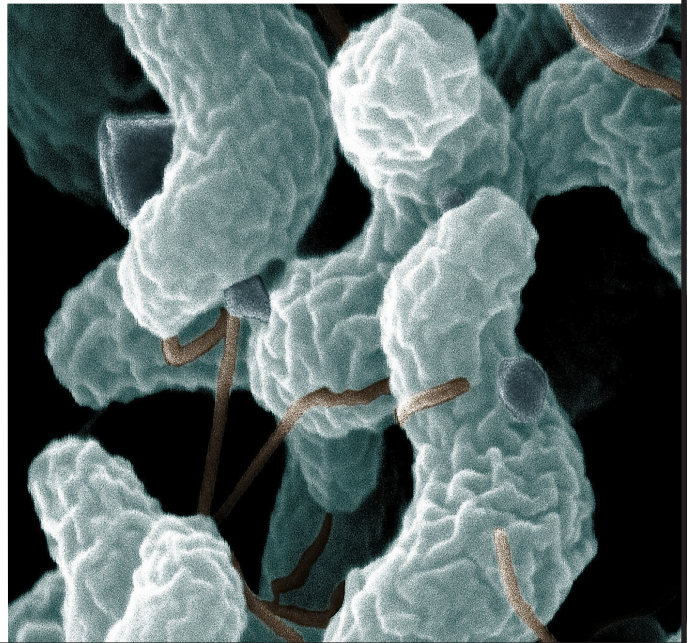
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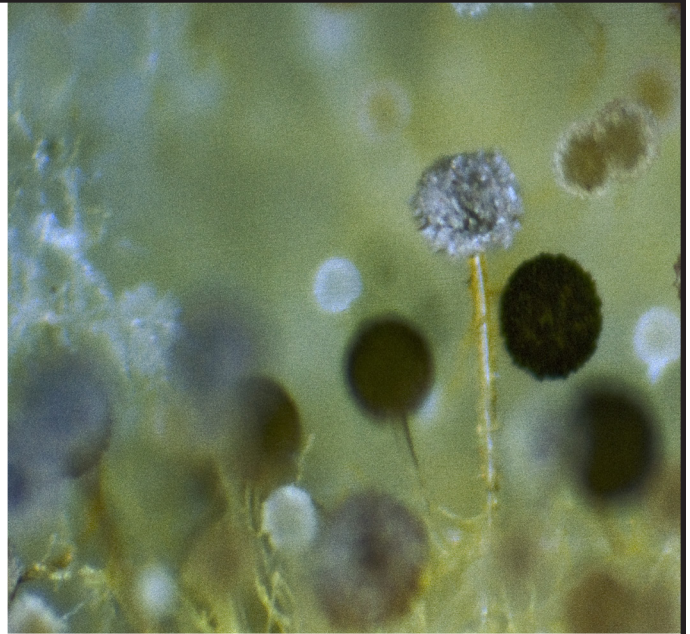
VA #1 Bacteria



- Bacteria are so small, 1,000 can fit on the head of a pin.
- Some have bodies shaped like grapes, hot dogs, or slugs.
- Bacteria have simple a cell structure, without a nucleus.
- Bacteria can break down almost anything, especially dead animals and plants.



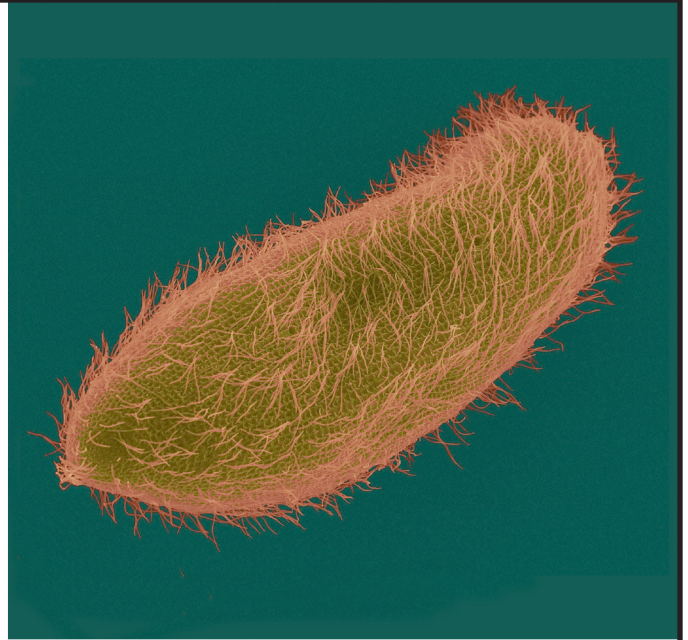
VA #2 Fungi



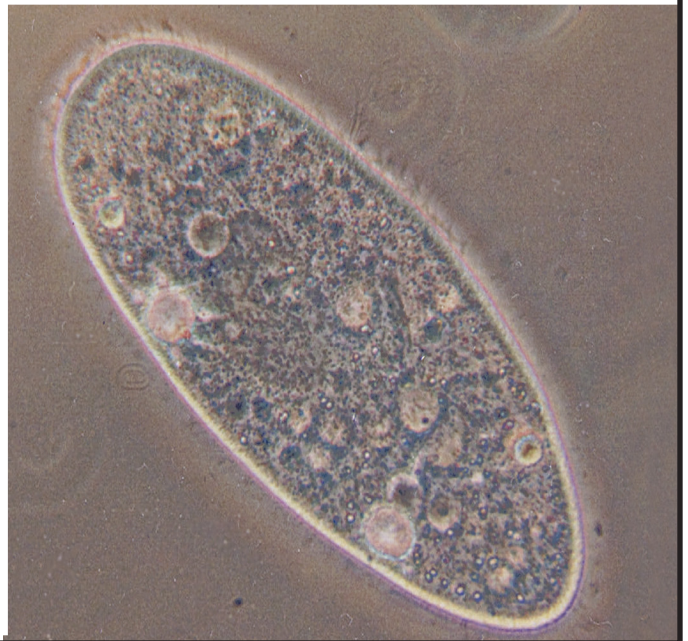
- Most fungi are too small to see, but some are as big as a football.
- Fungi have a body (mycelium) and thread-like structures (hyphae).
- Fungi come in many shapes and colors.
- Yeast, mold and mushrooms are fungi.



VA #3 Protists



- Most cannot be seen without a microscope.
- Protists live in water.
- Some protists use cilia (look like hair) to move in water.
- Some protists look like “blobs” full of water and can change shape as they move.



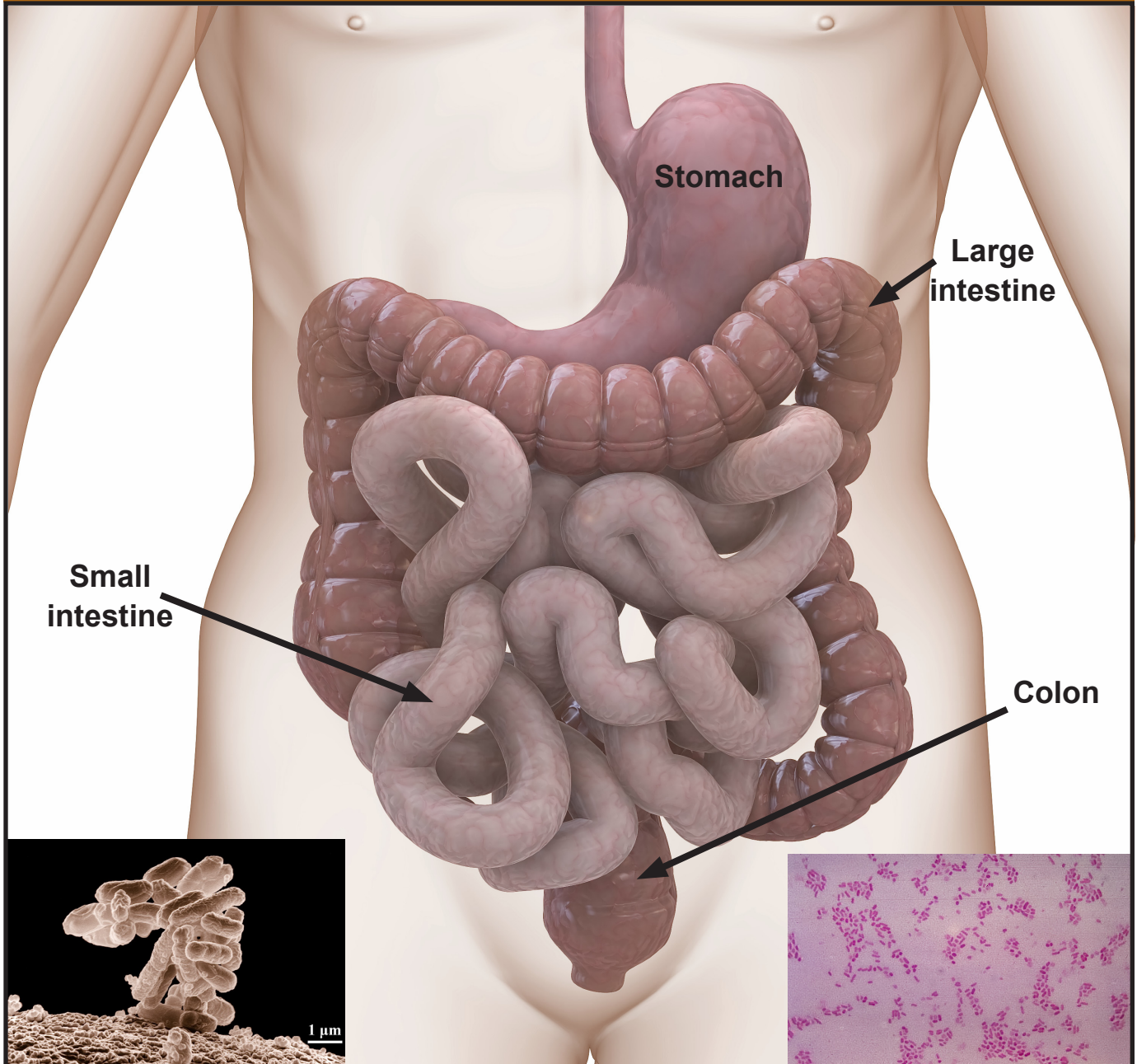
VA #4 Moldy Foods 1

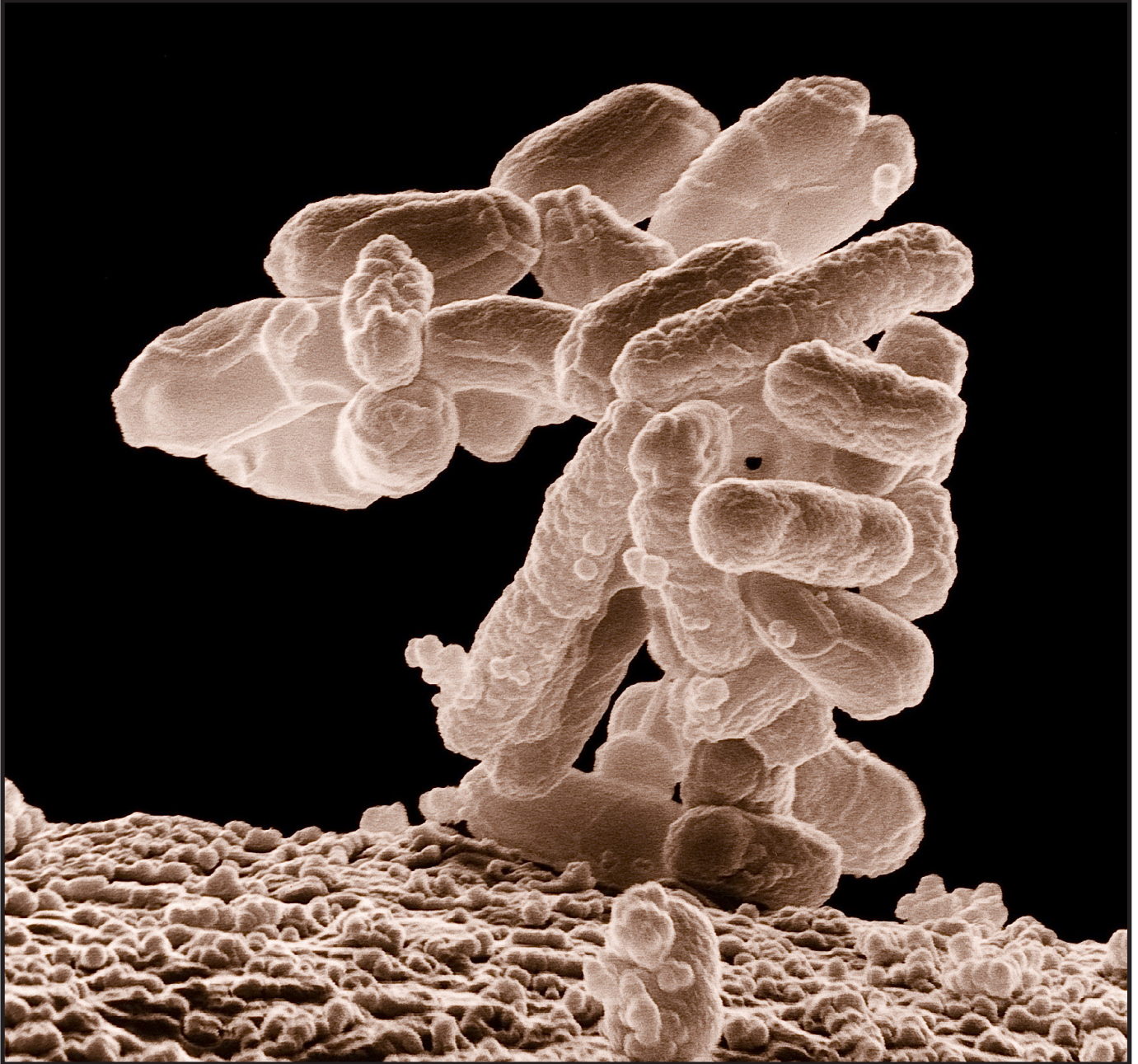


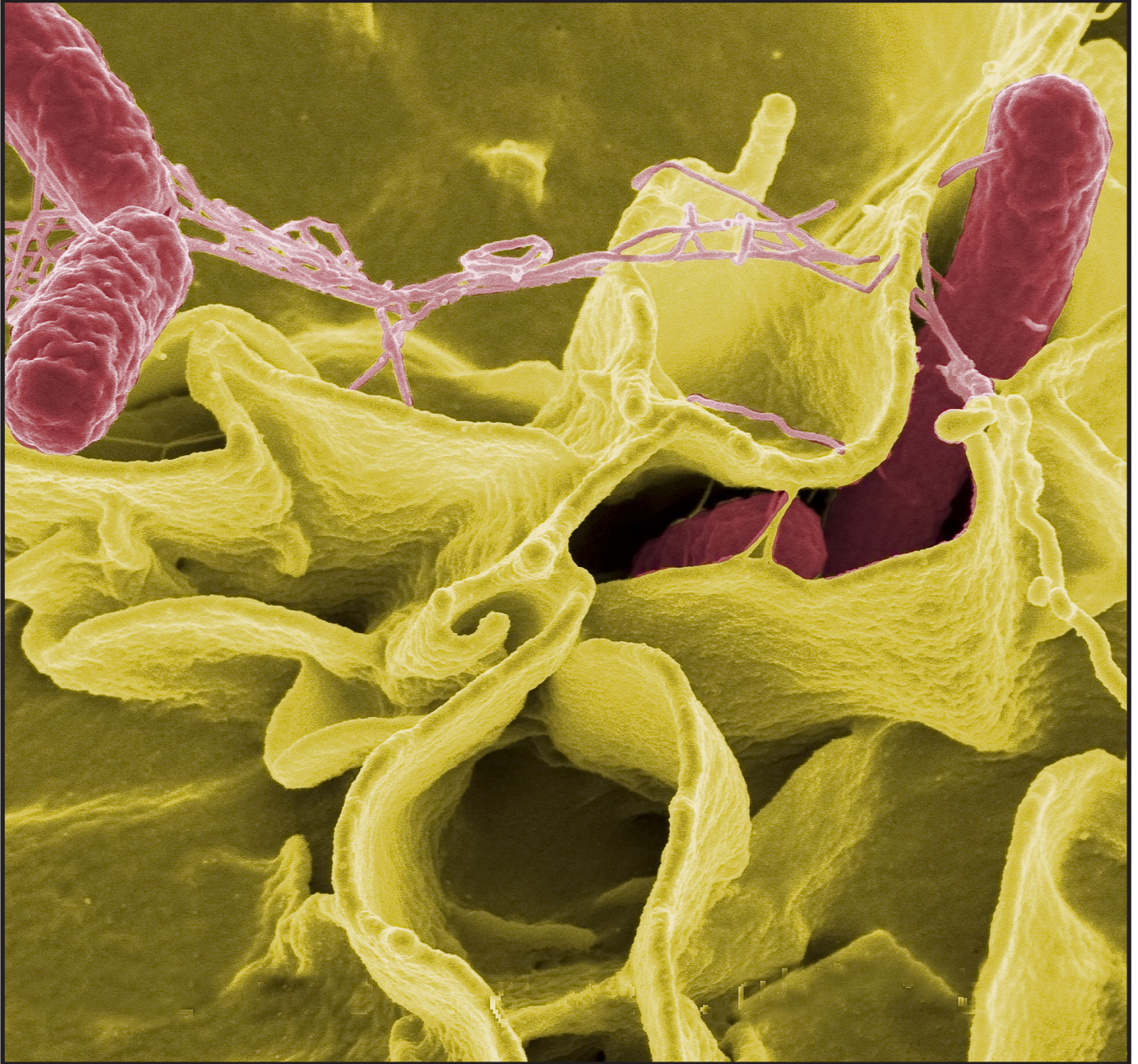
VA #5 Moldy Foods 2



VA #6 Bacteria Within the Digestive Tract



VA #7 *Escherichia coli* (*E. coli*)

VA #8 *Salmonella*

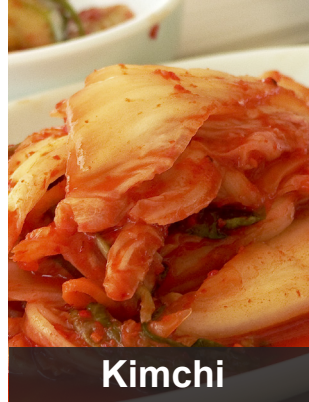
VA #9 Foods from Microorganisms



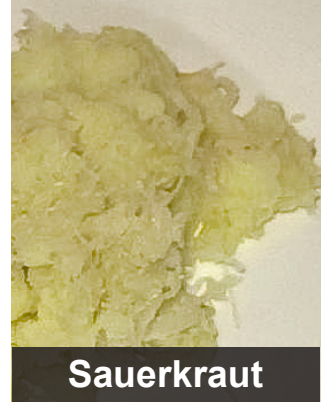
Vinegar



Blue cheese



Kimchi



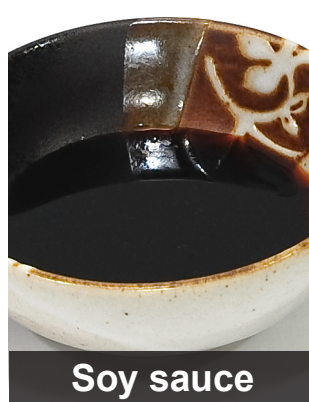
Sauerkraut



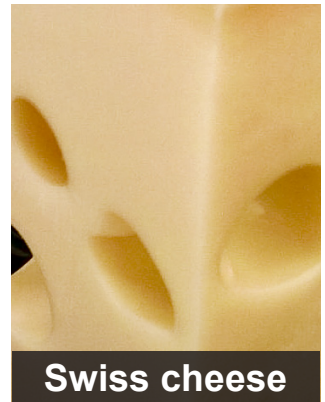
Sour cream



Bread



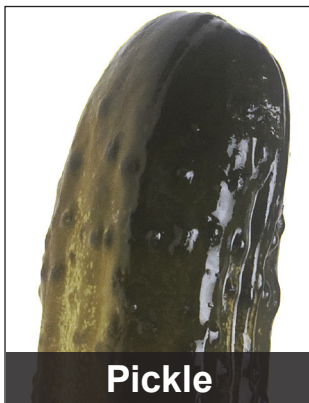
Soy sauce



Swiss cheese



Yogurt



Pickle

VA #10 Effects of Oil Spills 1



Oil spilled in the ocean

VA #11 Effects of Oil Spills 2



Damaged oil tanker following an oil spill

VA #12 Effects of Oil Spills 3



Oil on duck after an oil spill

(Note: People should wear gloves to handle animals covered in oil because chemical contaminants can travel through skin.)

VA #13 Effects of Oil Spills 4



Sea lion covered with oil

VA #14 Effects of Oil Spills 5

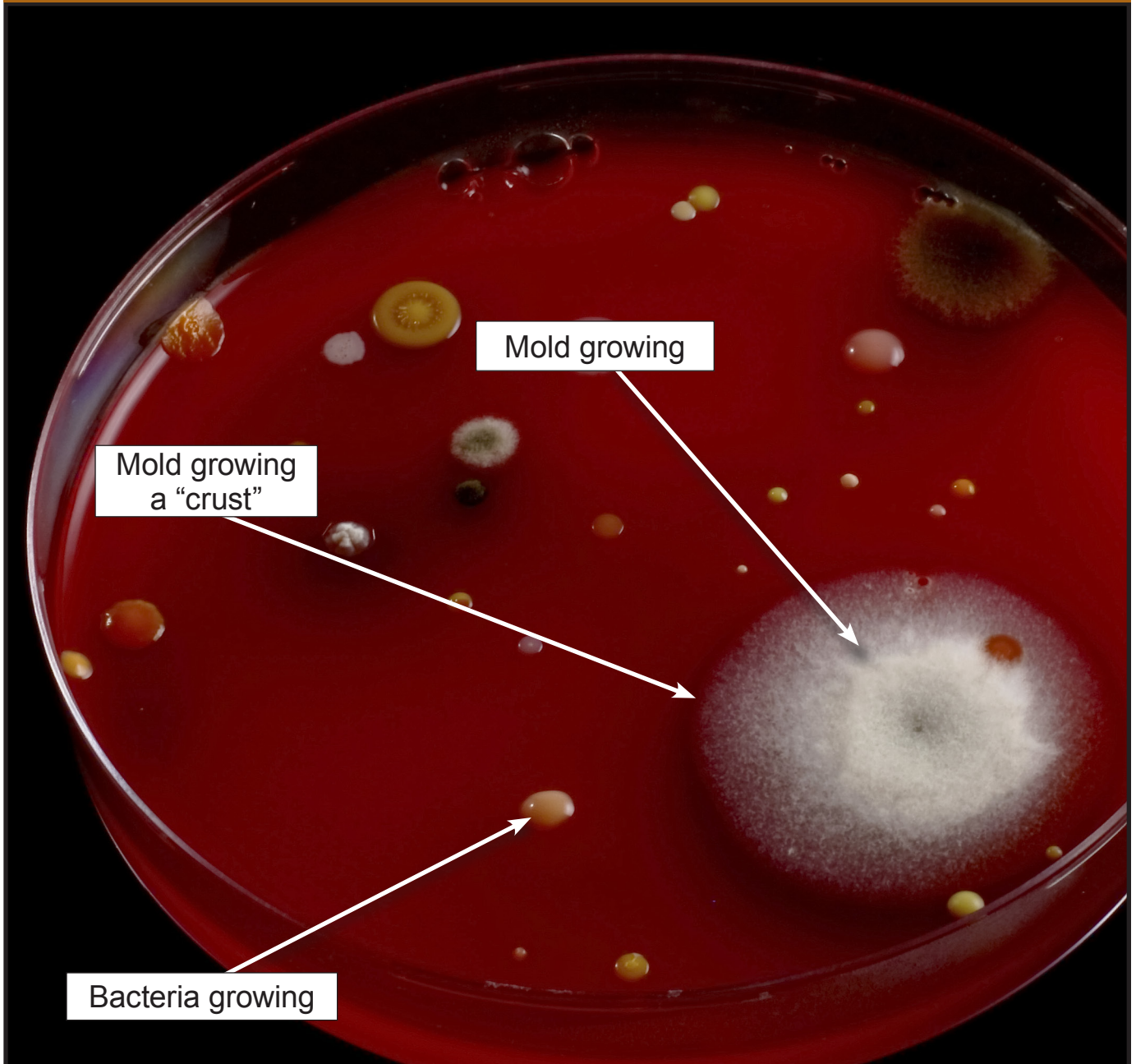


Workers cleaning a heavily oiled beach

VA #15 *Cyanobacteria*

***Cyanobacteria* help in the process
of cleaning up oil spills**

VA #16 Microorganism Battle





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